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ABSTRACT

This report discusses the outcomes of a study that used cluster analysis to identify groups/clusters of children (n=158) with severe emotional disturbances receiving services at a rural, mental health center in Southeastern Ohio. Extensive data were gathered at intake that included information regarding child and family characteristics and the child's presenting problem. Within this large amount of data, numerous "yes" or "no" survey questions for the parent or guardian of a child were used to assess risk factors. Eight questions were selected due to their perceived salience in predicting subsequent child functioning and mental health service utilization. The selected questions asked if the child had ever been arrested, hospitalized for psychiatric purposes, sexually abused, or physically abused. Questions also asked whether a child had been a sex perpetrator, run away from home, used drugs or alcohol, or attempted suicide. Five groups of children were identified using the eight risk factors present at intake. The groups were labeled physically abused, high runaway risk, high delinquent risk, low risk, and sexually abused. Not only were the groups different in terms of their initial risk factor presentation, but also groups differed in terms of their level of functioning. (CR)

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An Empirical Typology of Children with Severe Emotional Disturbances

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Introduction

Diagnosis has been one way to categorize those with mental health disorders into groups so that, in part, services can be tailored to fit an individual's needs. However, diagnosis alone, as a system of classification, does not account for other important differences that may exist among groups of mental health consumers (Skinner & Blashfield, 1982). Indeed, community mental health program administrators and consumers alike could benefit from alternative ways of identifying subgroups within the mental health system.

Cluster analysis is a multivariate procedure that has been shown to be a useful method in categorizing groups of mental health service consumers (Braucht & Kirby, 1986; Cyr, Atkinson, & Haley, 1986). Moreover, several investigators have identified key variables that separate different groups of children using this multivariate method (Lambert, Brannan, Breda, Heflinger, & Bickman, 1998; Christian, Frick, Hill, Tyler, & Frazer, 1996; Politano, Edinger, & Nelson, 1988). Essentially, cluster analysis is a statistical method of dividing cases into their naturally occurring homogeneous groupings. Unlike diagnosis, cluster analysis takes into account numerous factors outside of symptoms when forming subgroups of individuals.

The purpose of this study was to use cluster analysis to identify groups/clusters of children based on selected risk factors gathered at intake. Clusters were derived based on these characteristics, and using these clusters, differences in child functioning and demographic variables were examined.

Methods

Participants

Participants were 158 children with Severe Emotional Disturbances (SED) who were receiving services at a rural, mental health center in Southeastern Ohio. The state eligibility criteria for SED involves the primary diagnosis of a mental health disorder a six-month or greater duration of the problem, and functional impairment.

Measures

Extensive data was gathered at intake which included information regarding child and family characteristics, and the child's presenting problem. Within this large amount of data, numerous "yes" or "no" survey questions for the parent or guardian of a child were used to assess risk factors. Eight questions were selected due to their perceived salience in predicting subsequent child functioning and mental health service

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utilization. The selected questions asked if the child had ever been arrested, hospitalized for psychiatric purposes, sexually abused, or physically abused. Questions also asked whether a child had been a sex perpetrator, run away from home, used drugs or alcohol, or attempted suicide. Children were clustered into distinct groups based on the profiles derived from their parent or guardian's answers to the eight questions. Other demographic and functioning measures were completed at intake in order to validate the usefulness of the groups after the cluster analysis was performed.

Child and Adolescent Functional Assessment Scales (CAFAS). The CAFAS (Hodges & Wong, 1996) is a measure of child and adolescent functional impairment where higher scores represent poorer functioning. Nine scores are derived from the CAFAS: Role Performance (which can be divided into school, community, and home), Thinking, Behavior Toward Self and Others, Moods/Self-harm (can be divided into mood and self-harm scores), Substance Use, and a Total Score.

The Child Behavior Checklist (CBCL). The CBCL (Achenbach, 1991a) assesses the behavioral problems and social competencies of children and adolescents. Low scores on the social competencies scale indicates a lack of social competence, while high scores on the behavioral problems scale indicates greater levels of at-risk behaviors.

The Youth Self-Report Form (YSR). The YSR Form (Achenbach, 1991b) assesses an adolescent's own perceptions of his or her behavior and social competence.

Procedures

Clusters of children with SED were derived from an analysis of archival data obtained from a Community Mental Health Service Initiative site in Southeastern Ohio. Data were used at the expressed written consent of the Southern Consortium for Children. In order to determine the natural groupings of children with SED, a cluster analysis was performed using the responses to the eight risk factor questions. Cluster groups were then validated by examining clinical and demographic differences.

Results and Discussion

Cluster analysis of child risk factor profiles was performed using Ward's method with squared Euclidian distance. A five-cluster solution was selected based on the increase in error sum of squares and the utility and parsimony of the solution.

An overall analysis of variance for continuous measures and chi-square tests for categorical variables showed significant differences among clusters on 10 of 18 functioning and demographic measures. Table 1 displays the mean and standard deviation for each dependent measure as it applies to each subgroup, along with significant differences in functioning and demographic variables. The groups differed significantly on a variety of measures of functioning on the CAFAS scales, but showed no differences on the YSR, CBCL, or DSM-IV Global Assessment of Functioning. Group differences in age, sex, and number of felonies and misdemeanors committed were also noted. The five cluster profiles are displayed in Table 2, along with significant differences in demographic and clinical variables among the subgroups that were obtained via post hoc tests.

Implications

This study examined whether cluster analysis could be used to identify homogeneous groupings within a sample of children with SED. Specifically, five groups of children were identified using eight risk factors present at intake. The groups were labeled physically abused, high runaway risk, high delinquent risk, low risk, and sexually abused. Not only were the groups different in terms of their initial risk factor presentation, but also groups differed in terms of their level of functioning as evidenced by scores on the CAFAS. Clusters 2 (high runaway risk) and 3 (high delinquent risk) had the most impairment in functioning. Cluster 4 (low risk) presented with the best levels of functioning and fewest symptoms. Clusters 1 (physically abused) and 5 (sexually abused) had moderate levels of symptoms and functioning. The high standard deviations for some of the functioning measures suggest that interpretation of cluster differences should be made with caution.

The groups also differed on demographic variables. Groups 2 (high runaway risk) and 3 (high delinquent risk) were older than the other groups. In addition, group 2 (high runaway risk) had a higher proportion of females while group 3 (high delinquent risk) had a higher proportion of males. Interestingly, no differences in income were noted among the groups.

Overall, the cluster analysis identified practically meaningful groups that also evidenced differences in clinical presentation and demographic variables. The major limitation of this analysis was the small sample size. Therefore, these same groups might be examined in the future on a larger sample for the purpose of identifying differences in service needs or intensity, response to treatment, or other clinical or practical variables.

Table 1
Functioning and Demographic Characteristics of the Clusters

	Cluster 1 Physically Abused (N = 42)		Cluster 2 High Runaway (N = 32)		Cluster 3 High Delinquent (N = 14)		Cluster 4 Low Risk (N = 56)		Cluster 5 Sexually Abused (N = 14)	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Internal	65.1	15.5	71.1	11.3	57.3	20.3	62.9	11.1	66.7	9.1
External	68.6	14.6	70.6	12.6	64.9	20.2	65.8	10.9	66.1	13.4
YSR Totprob	63.8	9.6	65.7	12.0	55.6	19.9	56.1	16.3	65.8	13.0
CAFAS Total[a]	63.3	23.3	76.8	28.7	78.6	18.8	46.1	21.7	51.4	19.9
Substance[a]	4.8	8.9	4.2	7.2	12.9	9.9	0.7	3.3	0.0	0.0
Harmful[a]	5.0	9.8	16.1	12.0	5.8	10.8	1.3	7.8	5.4	8.8
School[a]	18.1	10.9	20.0	11.6	27.1	6.1	13.8	9.7	15.7	10.9
Home[b]	17.4	10.1	20.3	10.3	20.0	8.8	12.9	9.7	12.9	9.1
Community[a]	9.1	10.3	9.4	12.2	18.6	9.5	5.0	9.1	8.6	11.0
Behavior[b]	16.7	7.2	20.0	7.6	20.0	8.8	13.8	8.9	17.9	8.9
Mood[a]	14.5	8.0	19.7	8.4	15.0	9.4	11.1	8.8	9.2	8.6
Think	5.0	8.6	7.8	9.7	2.1	5.8	2.5	6.4	3.6	6.3
GAF	47.5	7.7	41.0	8.8	45.2	9.1	45.7	6.1	44.6	2.7
Age[a]	13.1	3.0	15.0	2.5	16.2	1.5	11.9	4.2	10.2	2.9
Income	1.6	2.9	2.9	1.4	2.8	1.5	2.8	1.3	2.3	1.1
Felonies[a]	0.07	0.35	0.25	0.5	1.4	2.4(	0.02	0.1	0.00	0.00
Misdemeanors[a]	0.17	0.50	1.13	3.0	2.0	2.4[illegible]	0.24	1.2	0.00	0.00
% Female[a]	26.0		59.0		7.0		25.0		29.0	

a Overall F or chi-square significant, $p<.003$, Bonferroni adjusted.
b Overall F approached significance, $p<.01$.

Table 2
Cluster Profiles

Clusters	Risk Factors	Clinical Profile	Demographic Info.
Cluster 1	Physically Abused (79%)	High: GAF	Younger
Cluster 2	Drugs & alcohol (100%) Runaway (100%) Suicide Attempt (88%) Hospitalization (38%)	Low: GAF High: CAFAS Total, Self Harm Poor: CAFAS Mood, Home Functioning, Behavior Toward Self and Others	Older, Female (60%)
Cluster 3	Arrested (100%) Drugs & alcohol (57%)	High: CAFAS Total, Substance Use Poor: School & Community Functioning, Behavior Toward Self and Others	Older, History of Misdemeanors or Felonies, Male (93%)
Cluster 4	None	Low: CAFAS Total, Good: School & Home Functioning, Behavior Toward Self and Others	Younger
Cluster 5	Sexually abused (100%) Sex perpetrator (71%) Physically abused (50%)	Low: CAFAS Total	Younger

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